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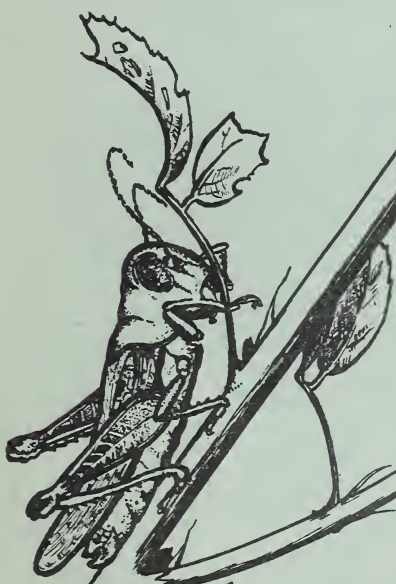
# New Insecticides for Grasshopper Control



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NEW INSECTICIDES FOR GRASSHOPPER CONTROL

Many farmers are now using sprays or dusts containing new insecticides instead of broadcasting bran-sawdust-sodium fluosilicate bait for grasshopper control. Of the various new chemicals tested, chlordane and chlorinated camphene have shown the most promise. Under certain conditions they are more effective than bait. These new insecticides are finding favor because they kill more rapidly and give better control of grasshoppers in tall, succulent growth along roadsides, railroad rights-of-way, canal banks, field margins, and in alfalfa. Chlordane and chlorinated camphene are most effective when applied to succulent vegetation where grasshoppers are feeding heavily. On bare ground, dry stubble, or in tall, dry vegetation which is no longer attractive to grasshoppers as food, bait is generally more effective and economical.

Insecticides containing chlordane or benzene hexachloride have been widely used for grasshopper control, both as dusts and as sprays. Those containing chlorinated camphene have not been so generally available, but comparative tests by the Bureau of Entomology and Plant Quarantine in 1947 showed them to be as effective as those containing chlordane. The results obtained with benzene hexachloride, although generally good, have been more variable.

When these new insecticides are applied as dusts or sprays directly to succulent growth along field margins, or to crops such as rank-growing alfalfa, young cotton, flax, or corn, they give quicker control and continue to kill longer than the standard sodium fluosolicate bait, which has been in general use for grasshopper control in recent years. The period of effectiveness ranges from 1 to 3 weeks, depending upon the weather, the amount and type of vegetation, the season, the age of

the grasshoppers, and to some extent on the particular formulation of the chemical used. Sprays and dusts containing these new chemicals have not been found more effective than the standard bran-sawdust-sodium-fluosilicate bait for controlling grasshoppers on range, idle lands, in small grains, or in field margins where vegetation is sparse.

## Dosages and Formulations

Research has shown that chlordane and chlorinated camphene give higher initial kill, and continue to kill over a longer period, when applied as sprays than when equal dosages are applied as dusts. When using sprays, apply 1 pound of technical chlordane or 1½ pounds of technical chlorinated camphene per acre. When using dusts, apply 1½ pounds of technical chlordane or 2 pounds of chlorinated camphene per acre. Late in the season, when most of the grasshoppers are adults and vegetation is tall and dense, a slight increase in the dosage of both sprays and dust may be necessary.

Chlordane and chlorinated camphene are marketed as emulsion concentrates, wettable powders, and dusts of various strengths. Emulsion concentrates and wettable powders may be diluted with water to suit available spraying equipment, but whatever the formulation or dilution the quantity of the technical material applied per acre should conform to the recommendations given.

## Time and Methods of Application

As is true of bait, these new insecticides must be properly applied at the right time, and in the right places, if they are to be effective. Likewise, as in the use of bait, it is much better for all property owners in a community to apply them at the same time. These new materials may be applied with ground dusters or sprayers of various types or from airplanes. However,

the equipment used should be carefully adjusted so that the rate of application may be accurately controlled. The insecticide should be evenly distributed over the area needing treatment. The use of too much material is not only wasteful but increases the danger of residues; the use of too little wastes labor and materials and does not prevent crop losses.

To farmers who intend to use one of these new insecticides for grasshopper control, the following advice is offered:

1. Remember that they, like most insecticides, are poisonous to man and livestock. Observe proper precautions in handling them and avoid feeding livestock on forage or pasture to which any of them has been applied.

2. Determine the location of dangerous infestations of young grasshoppers in relation to your crop lands. They may be found on roadsides, canal banks, field margins, or idle lands bordering cultivated fields, as well as in the fields themselves. Spray or dust these infestations when the main hatch is completed or when the young hoppers begin to move off the hatching grounds, and thus greatly reduce the acreage to be treated. Grasshoppers that damage row crops generally hatch in the field margins, where with timely baiting, dusting, or spraying they may be destroyed before they move into the fields.

3. To prevent grasshoppers from damaging corn, treat margins of cornfields and adjacent infested small-grain fields or weed patches when small grains begin to mature and before the hoppers move into the corn.

4. When an entire alfalfa field is infested with damaging populations of grasshoppers, it is ordinarily more economical to cut the alfalfa and then apply control measures to protect the next

cutting. The best procedure is to spray or dust field margins, ditch banks, patches of weeds, or uncut strips of alfalfa where grasshoppers have concentrated after the first crop is removed. Grasshoppers frequently hatch in considerable numbers after the first crop has been harvested and fields have been irrigated. These insects can be controlled by spraying or dusting the next crop when the vegetation is 6 to 10 inches high. By this practice heavy insecticide residues on this crop at harvesttime may be avoided and material damage to the new growth prevented unless other grasshoppers migrate into the field.

## Precautions

Forage treated with these new insecticides should not be fed to dairy animals. Stockmen should not feed treated vegetation to animals that are being fattened for slaughter.

A related chlorinated compound is known to accumulate in the fatty tissues of animals and is given off in milk and butter. It is therefore possible that chlordane or chlorinated camphene may behave similarly. Forage treated with these insecticides at dosages heavier than those needed for grasshopper control has been fed to meat animals continuously, and to the exclusion of any other feed, for several weeks without visable impairment of their health or development. It is possible, however, that meat animals fed for long periods on treated forage might accumulate enough of these chemicals in their fatty tissues to make the meat unfit for food.

Do not apply chlordane or chlorinated camphene to fruits or leafy vegetables when foliage or fruit that is to be used as food is on the plant, unless the residue can and will be removed by washing or stripping.

Avoid applying these new insecticides to legumes when in bloom or at the times of day when bees are active in the field.

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